



US Army Corps  
of Engineers  
Rock Island District



Defense Environmental Restoration Program  
for  
Formerly Used Defense Sites  
Ordnance and Explosive

# Archives Search Report

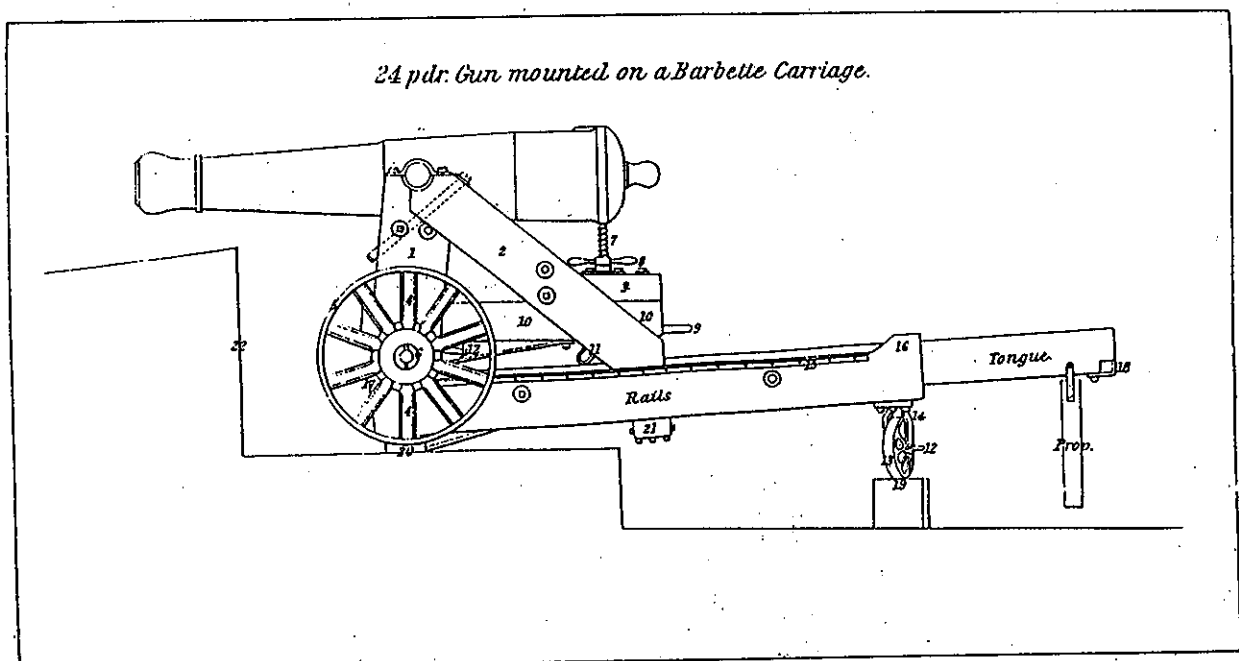
## Conclusions and Recommendations

for the former

### FORT SEWALL

MARBLEHEAD, MASSACHUSETTS  
PROJECT NUMBER D01MA054201

September 1997



DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
for  
FORMERLY USED DEFENSE SITES

Conclusions and Recommendations

ORDNANCE AND EXPLOSIVE  
ARCHIVES SEARCH REPORT  
FOR  
FORT SEWALL  
MARBLEHEAD, MASSACHUSETTS  
PROJECT NUMBER D01MA054201

September 1997

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ORDNANCE AND EXPLOSIVE  
ARCHIVES SEARCH REPORT  
FOR  
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MARBLEHEAD, MASSACHUSETTS  
PROJECT NUMBER D01MA054201

ACKNOWLEDGMENT				
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ORDNANCE AND EXPLOSIVE  
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The following conclusions and recommendations are provided by the Archives Search Report Team. These recommendations may not be the actions taken to remediate this site.

CONCLUSIONS AND RECOMMENDATIONS

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1. INTRODUCTION

a. **Subject and Purpose**

(1) This report presents the conclusions and recommendations of a historical records search and site inspection for the presence of ordnance and explosive (OE) located at Fort Sewall, Marblehead, Massachusetts (See plate 1 for general location map). The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS).

(2) The investigation focused on two and a half acres that were identified as a fortification. The site was used as a coastal defense site from 1634 to 1922.

(3) The purpose of this investigation was to characterize the site for potential OE presence, to include conventional ammunition and chemical warfare material (CWM). The investigation was conducted by experienced ordnance experts through thorough evaluation of historical records, interviews, and on-site visual inspection results.

b. **Scope**

(1) This report presents the site history, site description, real estate ownership information, and confirmed ordnance presence (prior to and after site closure), based on available records, interviews, site inspections, and analyses. The analyses provide a complete evaluation of all information to assess current day potential ordnance presence, where actual ordnance presence has not been confirmed.

(2) For the purpose of this report, OE presence consists of live ammunition, ammunition components, CWM or explosives which have been lost, abandoned, discarded, buried, fired, or thrown from demolition pits or burning pads. These items were either manufactured, purchased, stored, used, and/or disposed of by the War Department or the Department of Defense. Such ammunition/components are no longer under accountable record control of any DOD organization or activity.

(3) **Expended** small arms ammunition (caliber .50 or smaller) is **not** considered OE presence. OE further includes "explosive soil" which refers to any mixture in soil, sands, clays, etc., such that the mixture itself is explosive. Generally, 10 percent or more by weight of secondary explosives in a soil mixture is considered explosive soil.

## 2. CONCLUSIONS

### a. **Summary of Conclusions**

Table 2-1, on the following page, has been provided to summarize conclusions made on confirmed, potential and no OE areas within Fort Sewall.

### b. **Historical Site Summary**

(1) A fortification of some kind has been on this site since the earliest colonial times. An earthwork was constructed on the site by the town of Salem as early as 1634. The fort became a responsibility of Marblehead when that town was incorporated in 1649. The fort was described as a breastwork with platforms for twelve guns in 1742. During the Revolutionary War, the fort was manned by militia, but no shots are known to have been fired in anger.

(2) The federal government acquired title to the property in 1794. Construction of a new fort on the site commenced in the same year. This fort was about 100 feet square and occupied a portion of the site. The fort was later enlarged and occupied the entire site by 1801.

(3) Fort Sewall was garrisoned from 1800 to 1803 and again from 1809 to 1821. During the War of 1812, British prisoners of war were held in the fort. After 1821

TABLE 2-1  
SUMMARY OF CONCLUSIONS

Area	Former Usage	Present Usage	Probable End Usage	Size Acres <u>1/</u>	FUDS ELIGIBILITY		ORDNANCE PRESENCE			
					Confirmed FUDS	Potential FUDS	Confirmed Ordnance Presence	Potential Ordnance Presence	Uncontaminated	Risk Assessment Code
A	Fort Sewall	Town Park	Same	2.5	yes	-	-	-	yes	5
B	Fort Sewall Expansion	Private Residences	Same	1.7	yes	-	-	-	yes	5
		Barren Rock								
<u>1/</u> Indicates approximate acreage				4.2						



the fort was placed in a caretaker status due to the reduction in size of the Army.

(4) During the Civil War the fort was rebuilt and expanded. Approximately 1.7 acres of land not owned by the federal government was used for this expansion. The real estate transactions for this expansion are unknown. It is unknown if the fort was actively garrisoned by federal troops during the Civil War.

(5) The fort was ordered abandoned by the Secretary of War in 1884. In 1885 the site was under the control of the Treasury Department and in 1889 the site was under the control of the Town of Marblehead. During this period the War Department retained title to the property.

(6) During the Spanish-American War, the fort was garrisoned by federalized militia. The militia did not remain at the fort for more than three months.

(7) During the First World War, the fort was inactive. The site was conveyed to the Town of Marblehead for use as a public park in 1922.

#### **c. Site Eligibility**

(1) Former land usage by the War Department was confirmed for the site as summarized in sections 2 and 5 of the findings of this report. The approximately 4.2 acre site was used as a coastal defense site from 1634 to 1922.

(2) By 1922, all acreage that had been used by the War Department was relinquished. Today, no ownership of any part of the former installation remains with the Department of Defense (See plate 4).

#### **d. Visual Site Inspection**

(1) Site inspection was conducted 25 June 1997. During this inspection, no OE was observed.

(2) Interviews were conducted with local residents, police officers, county officials, and town officials. In that this is a pre-World War I site, efforts to locate individuals who had served or had first hand knowledge of

Fort Sewall when it was used by the military were impossible.

(3) The caretaker of Fort Sewall Town Park was interviewed by the assessment team. He has lived in Marblehead all of his life. He has been caretaker of the park for at least twenty years. He stated that no ordnance of any type has been found in the fort.

#### **e. Confirmed Ordnance Subsites**

(1) Confirmed ordnance and explosives (OE) presence is based on verifiable historical record evidence or direct witness of OE items (with explosive components and/or inert debris/fragments) since site closure. Additional field data are not needed to identify a confirmed site.

(2) Verifiable historical record evidence is based on OE items actually seen on site since site closure and authenticated by: historical records (Archive Records, Preliminary Assessment Reports, Site Investigation Reports), local fire departments and law enforcement agencies/bombs squads, military Explosive Ordnance Disposal (EOD) Units, newspaper articles, photographs, or maps.

(3) Direct witness of OE items consists of the site inspection team(s) and other credible witnesses as determined by the ASR Research Team Leader (landowners, workers on-site, soldiers who served there, etc.) verifying that they have seen OE presence on the surface or subsurface since site closure.

(4) No area of this site was determined to have confirmed OE presence.

#### **f. Potential Ordnance Subsites**

(1) Potential ordnance and explosives (OE) presence is based on a lack of confirmed OE presence. Potential OE presence is inferred from records, present day site features, non-verifiable direct witness, or indirect witness. Additional field data are needed to confirm potential OE sites.

(2) Inference from historical records is based on no OE items actually seen on site since site closure and would include documentation (records, aerial photographs, maps) indicating possible OE presence derived from common practice in production, storage, use, or disposal at that time and from records indicating known OE usage.

(3) Inference from present day site features would be the indication of possible OE presence from such obvious features as target circles, depressions, mounds/backstops, OB/OD areas/pits, etc. Indirect witness would be people who have stated that they have heard of OE presence on-site (hear-say evidence).

(4) No area of this site was determined to have **potential** OE presence.

#### **g. Uncontaminated Ordnance Subsites**

Uncontaminated ordnance areas are based on a lack of confirmed or potential ordnance presence. Both Fort Sewall (Area A), and the Fort Sewall Expansion (Area B) are considered **uncontaminated**. The Risk Assessment and Table 2-1 are based on this premise.

#### **h. Other Environmental Hazards**

There are no other known environmental hazards at Fort Sewall.

### **3. RECOMMENDATIONS**

#### **a. Summary of Recommendations**

Table 3-1 on the following page includes an overall summary of the site recommendations. Explanations are included in subsequent paragraphs.

#### **b. Preliminary Assessment Actions**

An area of immediately adjacent to the boundary described in the FDE, 1.7 acres, is potentially eligible. This acreage contained an expansion to the fortification during the Civil War (see Plate 3). As no projects are

TABLE 3-1 SUMMARY OF RECOMMENDATIONS								
Area	Former Usage	Size Acres <u>1/</u>	PA Actions	OE Actions			HTRW Actions	BD/DR Actions
			Prepare INPR	No Further Action	Implement Interim Removal	Perform EE/CA	Perform SI	Perform SI
A	Fort Sewall	2.5	-	yes	-	-	-	-
B	Fort Sewall Expansion	1.7	-	yes	-	-	-	-
<u>1/</u> Acreages are approximate only								

envisioned in this area, no further Preliminary Assessment actions are required.

**c. Ordnance and Explosive Actions**

(1) All areas of this site are uncontaminated. Recommend no further actions (NOFA) for this site.

(2) There are no issues and concerns associated with this site.

**d. Other Environmental Remediation Actions**

No other environmental remediation actions will be required at this time.

ORDNANCE AND EXPLOSIVE  
ARCHIVES SEARCH REPORT  
FOR  
FORT SEWALL  
MARBLEHEAD, MASSACHUSETTS  
PROJECT NUMBER D01MA054201

ATTACHMENTS

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Previous editions obsolete

RISK ASSESSMENT PROCEDURES FOR  
ORDNANCE AND EXPLOSIVES (OE) SITES

Site Name	<u>Fort Sewall</u>	Rater's Name	<u>George Ofslager</u>
Site Location	<u>Marblehead, MA</u>	Phone No.	<u>309-794-6024</u>
DERP Project #	<u>D01MA054201</u>	Organization	<u>CEMVR-ED-DO</u>
Date Completed	<u>18 September 1997</u>	RAC Score	<u>5</u>

OE RISK ASSESSMENT: Entire Site

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OE risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OE hazards identified at the site. The risk assessment is composed of two factors, **hazard severity** and **hazard probability**. Personnel involved in visits to potential OE sites should view the CEHND videotape entitled "A Life Threatening Encounter: OE."

Part 1. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPES OF ORDNANCE  
(Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	10
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	6
Landmines, Practice (w/spotting charges)	4
Small Arms, Complete round (.22 cal-.50 cal)	1
Small Arms, Expended	0
Conventional Ordnance and Ammunition	<u>0</u>
<u>(Select the largest single value)</u>	
What evidence do you have regarding conventional OE?	<u>None.</u>

**A**



B. Pyrotechnics. (For munitions not described above)

VALUE

Munition (Container) Containing  
White Phosphorous or other  
Pyrophoric Material (i.e.,  
Spontaneously Flammable) 10

Munition Containing a Flame  
or Incendiary Material (i.e. Napalm,  
Triethylaluminum Metal Incendiaries) 6

Flares, Signals, Simulators, Screening  
Smoke (other than WP) 4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? None.

C. Bulk High Explosives (Not an integral part of convention ordnance;  
uncontainerized.)

VALUE

Primary or Initiating Explosive  
(Lead Styphnate, Lead Azide,  
Nitroglycerin, Mercury Azide,  
Mercury Fulminate, Tetracene, etc.) 10

Demolition Charges 10

Secondary Explosives  
(PETN, Composition A, B, C,  
Tetryl, TNT, RDX, HMX, HBX,  
Black Powder, etc). 8

Military Dynamite 6

Less Sensitive Explosives  
(Ammonium Nitrate, Explosive D, etc). 3

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? None.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or  
other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants 6

Propellants 0

What evidence do you have regarding propellants? None

E. Chemical Warfare Material and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear)	5
Chemical and Radiological ( <u>Select the largest single value</u> )	<u>0</u>
What evidence do you have of chemical/radiological OE?	<u>None.</u>

=====

TOTAL HAZARD SEVERITY VALUE 0  
 (Sum of Largest Values for A through E--Maximum of 61).  
 Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY\*

Description	Category	Hazard Severity Value
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	(IV)	1 to 4
**NONE		0

\* Apply Hazard Severity Category to Table 3.

\*\* If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other related factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF CONTAMINATION  
(Circle all values that apply)

A. Locations of OE Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined locations	4
Inside walls, ceilings, or other parts of Buildings or Structures	3
Subsurface	2
Location ( <u>Select the single largest value</u> )	_____
What evidence do you have regarding location of OE?	_____
	_____
	_____

B. Distance to nearest inhabited locations or structures likely to be at risk from OE hazard (roads, parks, playgrounds, and buildings).

	VALUE
Less than 1250 feet	5
1250 feet to 0.5 miles	4
0.5 miles to 1.0 miles	3
1.0 miles to 2.0 miles	2
Over 2 miles	1
Distance ( <u>Select the single largest value</u> )	_____
What are the nearest inhabited structures?	_____
	_____
	_____

C. Number of buildings within a 2 mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings ( <u>Select the single largest value</u> )	_____
Narrative _____	

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings ( <u>Select the largest single value</u> )	_____
Describe types of buildings in the area. _____	

E. Accessibility to site refers to access by humans to ordnance and explosives. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (of any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated Site	1
a 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility, or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitor, locked entrance, or controlled roadway access to the facility).	0
Accessibility ( <u>Select the single largest value</u> )	_____
Describe the site accessibility. _____	
_____	
_____	

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Example would be excessive soil erosion by beaches or streams, increasing land development that could reduce distance from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics ( <u>Select largest value</u> )	_____
Describe the site dynamics. _____	
_____	
_____	

=====

Total Hazard Probability Value  
(Sum of Largest Values for A through F--Maximum of 30)

Apply this value to Hazard Probability Table 2 to determine  
Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY\*

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

-----

\* Apply Hazard Probability Level to Table 3.

=====

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

- RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-OE-ES - commercial (205) 895-1582 or DSN 645-1582.
- RAC 2 High priority on completion of INPR - Recommend further action by CEHND.
- RAC 3 Complete INPR - Recommend further action by CEHND.
- RAC 4 Complete INPR - Recommend further action by CEHND.
- RAC 5** Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

=====  
Part IV. Narrative. Summarize the documented evidence that support this risk assessment. If no documented evidence was available, explain all the assumptions that you made.  
Ordnance was once present at this site. However, there is no evidence to suggest that any OE remains. The site is either bare rock or bedrock covered with a very thin layer of soil, which makes burial next to impossible. The site has been used as a town park since at least 1922 and there are no reports of ordnance being discovered. NOFA recommended.

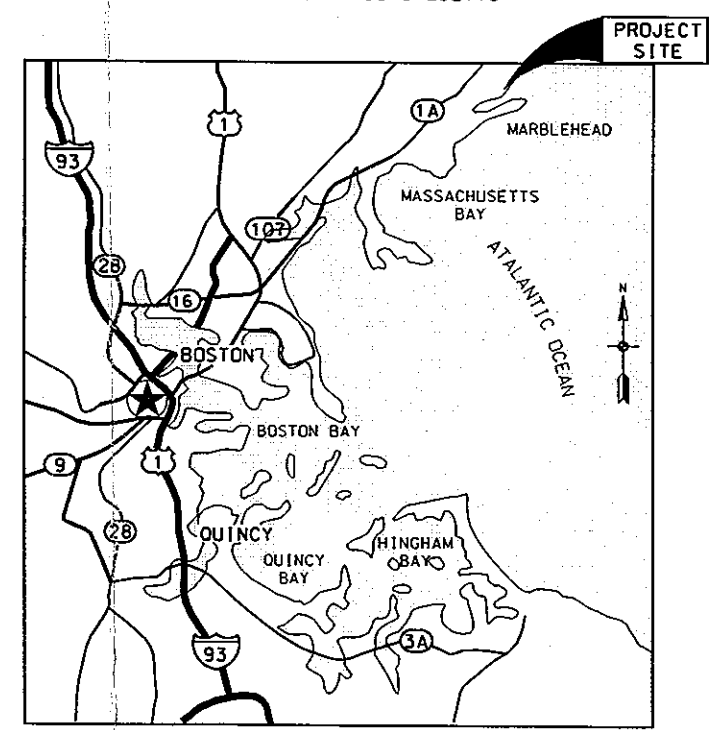
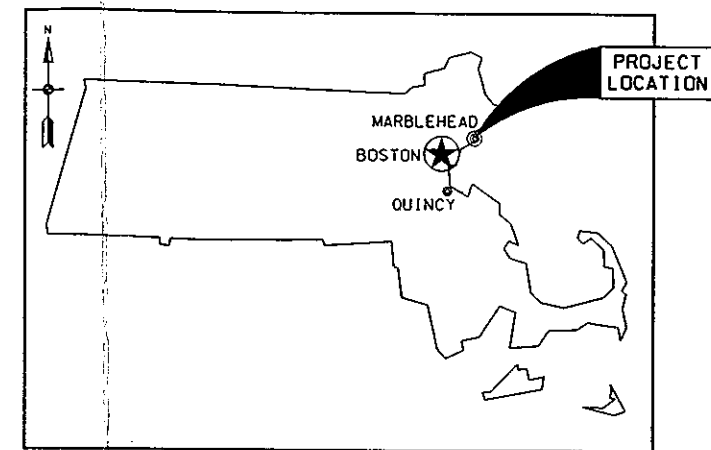
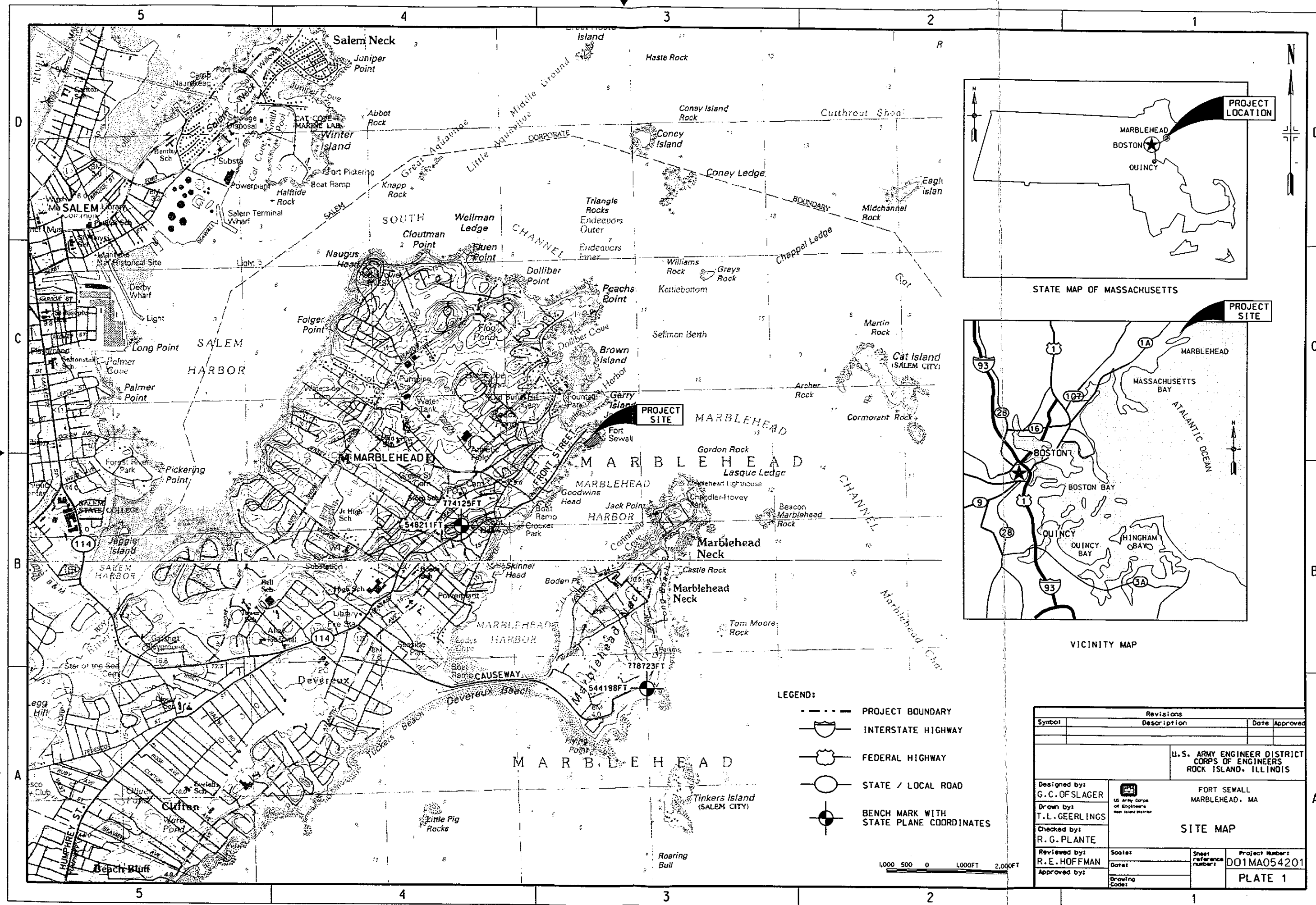
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ORDNANCE AND EXPLOSIVE  
ARCHIVES SEARCH REPORT  
FOR  
FORT SEWALL  
MARBLEHEAD, MASSACHUSETTS  
PROJECT NUMBER D01MA054201

REPORT PLATES



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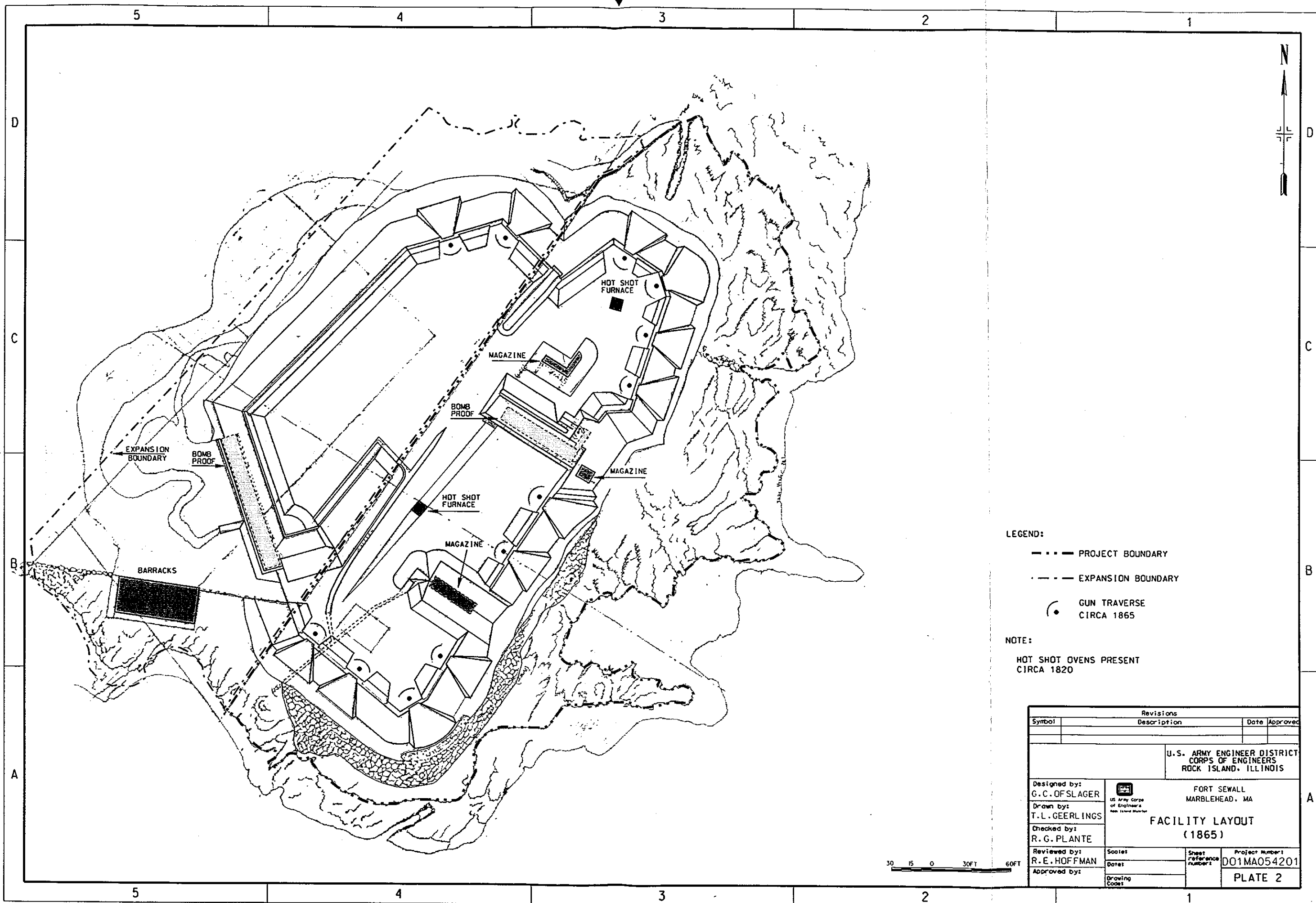


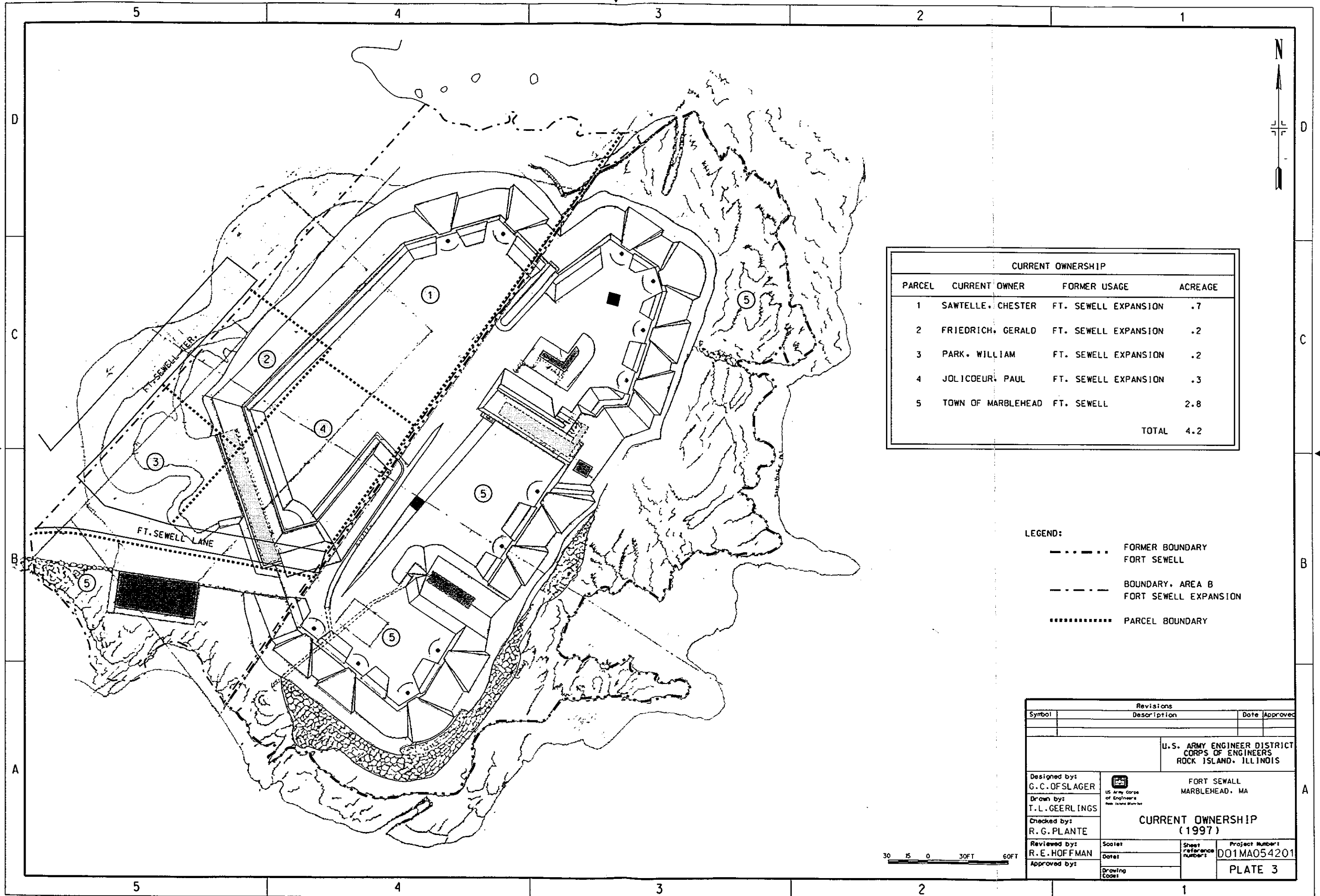
- LEGEND:
- PROJECT BOUNDARY
  - INTERSTATE HIGHWAY
  - FEDERAL HIGHWAY
  - STATE / LOCAL ROAD
  - BENCH MARK WITH STATE PLANE COORDINATES

1,000 500 0 1,000FT 2,000FT

Revisions		
Symbol	Description	Date Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS		
Designed by:	FORT SEWALL MARBLEHEAD, MA	
Drawn by:	SITE MAP	
Checked by:		
Reviewed by:		
Approved by:		
Soiler	Sheet reference number	Project Number
Date		DO1MA054201
Drawing Code		PLATE 1


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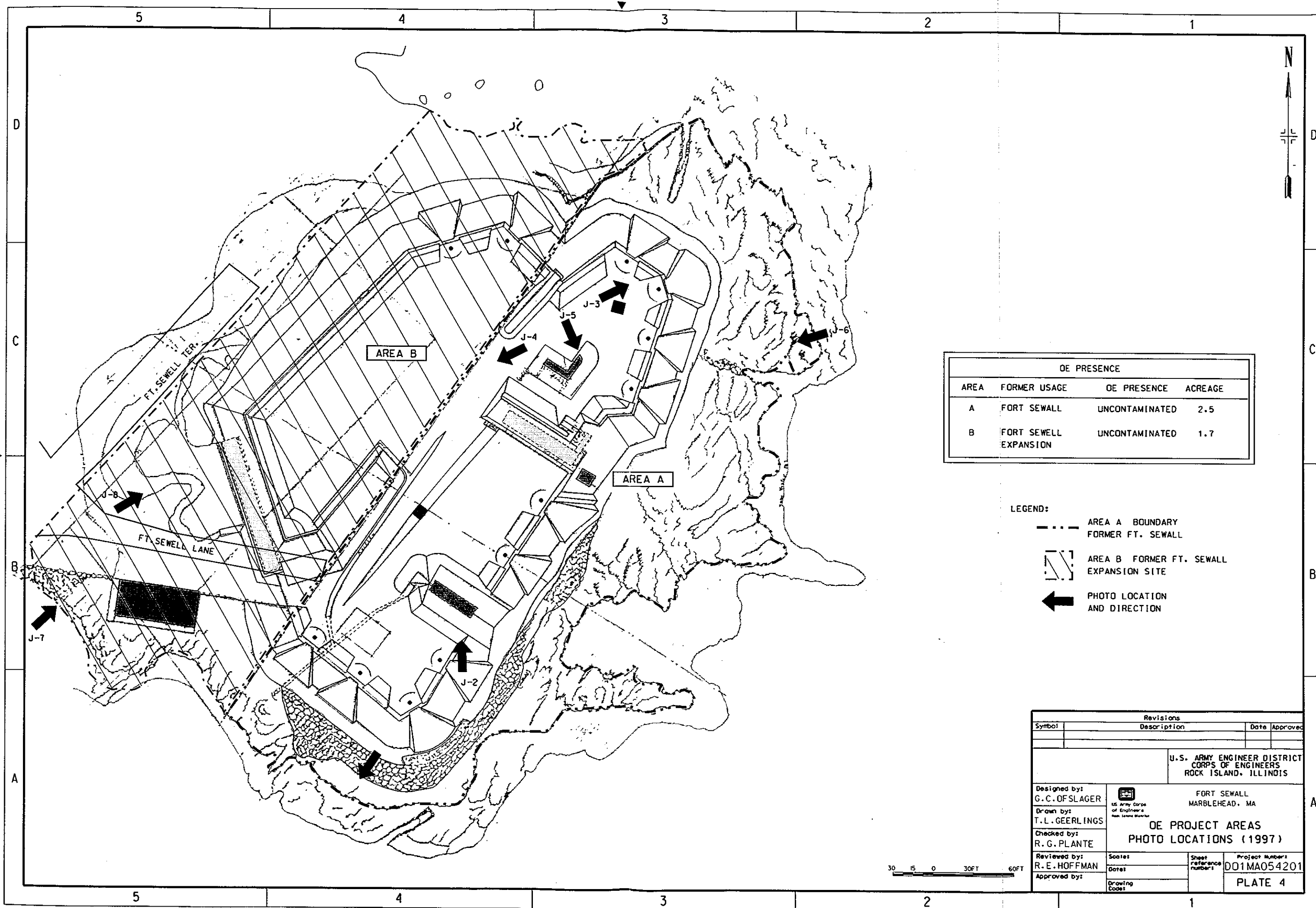


CURRENT OWNERSHIP				
PARCEL	CURRENT OWNER	FORMER USAGE	ACREAGE	
1	SAWTELLE, CHESTER	FT. SEWELL EXPANSION	.7	
2	FRIEDRICH, GERALD	FT. SEWELL EXPANSION	.2	
3	PARK, WILLIAM	FT. SEWELL EXPANSION	.2	
4	JOLICOEUR, PAUL	FT. SEWELL EXPANSION	.3	
5	TOWN OF MARBLEHEAD	FT. SEWELL	2.8	
TOTAL			4.2	

LEGEND:			
---	FORMER BOUNDARY	FORT SEWELL	
---	BOUNDARY, AREA B	FORT SEWELL EXPANSION	
.....	PARCEL BOUNDARY		

Revisions			
Symbol	Description	Date	Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by: G.C. OFSLAGER	 U.S. Army Corps of Engineers Rock Island District	FORT SEWELL MARBLEHEAD, MA	
Drawn by: T.L. GEERLINGS		CURRENT OWNERSHIP (1997)	
Checked by: R.G. PLANTE		Scale:	Project Number: DD1MA054201
Reviewed by: R.E. HOFFMAN		Date:	Sheet reference number: PLATE 3
Approved by:	Drawing Code:		

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OE PRESENCE			
AREA	FORMER USAGE	OE PRESENCE	ACREAGE
A	FORT SEWALL	UNCONTAMINATED	2.5
B	FORT SEWALL EXPANSION	UNCONTAMINATED	1.7

LEGEND:

- AREA A BOUNDARY FORMER FT. SEWALL
- [Hatched Box] AREA B FORMER FT. SEWALL EXPANSION SITE
- ← PHOTO LOCATION AND DIRECTION

Revisions		Date		Approved	
Symbol	Description				
<p>U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS</p>					
<p>Designed by: G.C. OFSLAGER</p> <p>Drawn by: T.L. GEERLINGS</p> <p>Checked by: R.G. PLANTE</p> <p>Reviewed by: R.E. HOFFMAN</p> <p>Approved by:</p>		<p>U.S. ARMY CORPS OF ENGINEERS Non-Irradiated Material</p> <p>FORT SEWALL MARBLEHEAD, MA</p> <p>OE PROJECT AREAS PHOTO LOCATIONS (1997)</p>			
<p>Scale:</p> <p>30 15 0 30FT 60FT</p>		<p>Sheet reference number:</p>		<p>Project Number:</p>	
<p>Drawing Code:</p>		<p>DD1MA054201</p>		<p>PLATE 4</p>	